

TLA's *Vista Oaks Preliminary Drainage Report* and addendum, *Highland Crown Preliminary Drainage Report*, evaluated the potential for project-related flooding during the 2-year, 10-year, and 100-year storm events. As noted previously, the *Dry Creek Flood Control Plan* identifies the Vista Oaks and Highlands Parcel A project sites as being located in an area where local detention is not recommended. Design criteria used by TLA, including descriptions of the HEC-1 2000 modeling and inputs for precipitation, soils and infiltration, culvert and channel design, and overland drainage, are described on pages 4 through 8 of the *Vista Oaks Preliminary Drainage Report* and pages 3 through 6 of the *Highland Crown Preliminary Drainage Report*. The HEC-1 analysis of post-project conditions indicates that the proposed projects would result in a height increase of 0.0007 feet in the peak flow of Secret Ravine Creek during a 100-year storm event, assuming as previously stated that the projects' peak flows were to occur at the same time as the peak flow arrives from the upstream Secret Ravine watershed.

TLA's HEC-1 modeling found that the proposed Vista Oaks and Highlands Parcel A projects would not create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems. Furthermore, the bridge structure planned for placement in the 100-year floodplain would not significantly increase the extent of the 100-year floodplain (see discussion below).

#### Proposed Secret Ravine Creek Bridge

The April 2004 Bridge Analysis conducted by TLA evaluated two alternatives:

- Bridge Alternative A: a 25-foot long bridge (one 25-foot span) with top of bridge deck elevation at 199.5 feet (estimated to be equivalent to the water surface elevation of a 1-year storm event at a flow of 415 cfs. Elevations are given in the Vista Oaks datum base, which was assumed to be the NGVD29 (FEMA) elevation plus 0.60 feet); and
- Bridge Alternative B: a 50-foot long bridge (two 25-foot spans) with top of bridge deck elevation at 201.7 feet (estimated to be equivalent to the water surface elevation of a 4-year storm event at a flow of 920 cfs).

At the City's request, TLA prepared a Revised Bridge Analysis in June 2004. The revised analysis evaluated three alternatives, which included the previous two alternatives as well as:

- Bridge Alternative C: a 125-foot long bridge (five 25-foot spans) with top of bridge deck elevation at 204.5 feet (estimated to be equivalent to the water surface elevation of a 10-year storm event at a flow of 1,967 cfs).

Each of these three alternative bridge alignments was assumed to occur at the same location, HECRAS Station ID 9770 at bridge centerline (please refer to Appendices A-C in the *Vista Oaks Rocklin EIR Bridge Alternative Storm Impact Analysis*, in Appendix F of this Draft EIR). The analysis considered storm events of 2, 10, 25, and 100 years and their respective impacts on the bridge alternatives. The top of bridge decking grade (surface elevation) was assumed to extend on either side of the bridge until it reached a higher existing ground elevation, ensuring that the top of bridge decking elevation would be the lowest point along the stream cross-section for calculating impacts. The modeling also assumed a solid, 54-inch railing along the length of the bridge as if it were completely blocked with debris to determine the maximum impact of the bridge on high water flows of the creek.

Based on PCFCWCD comments on the June 2004 analysis, TLA prepared a July 2004 Supplemental Analysis, which evaluated Bridge Alternative C with one 25-foot span blocked by debris at 1) the original location, and 2) 50 feet upstream, at HECRAS Station ID 9820 at bridge centerline (refer to Appendix G of this Draft EIR).

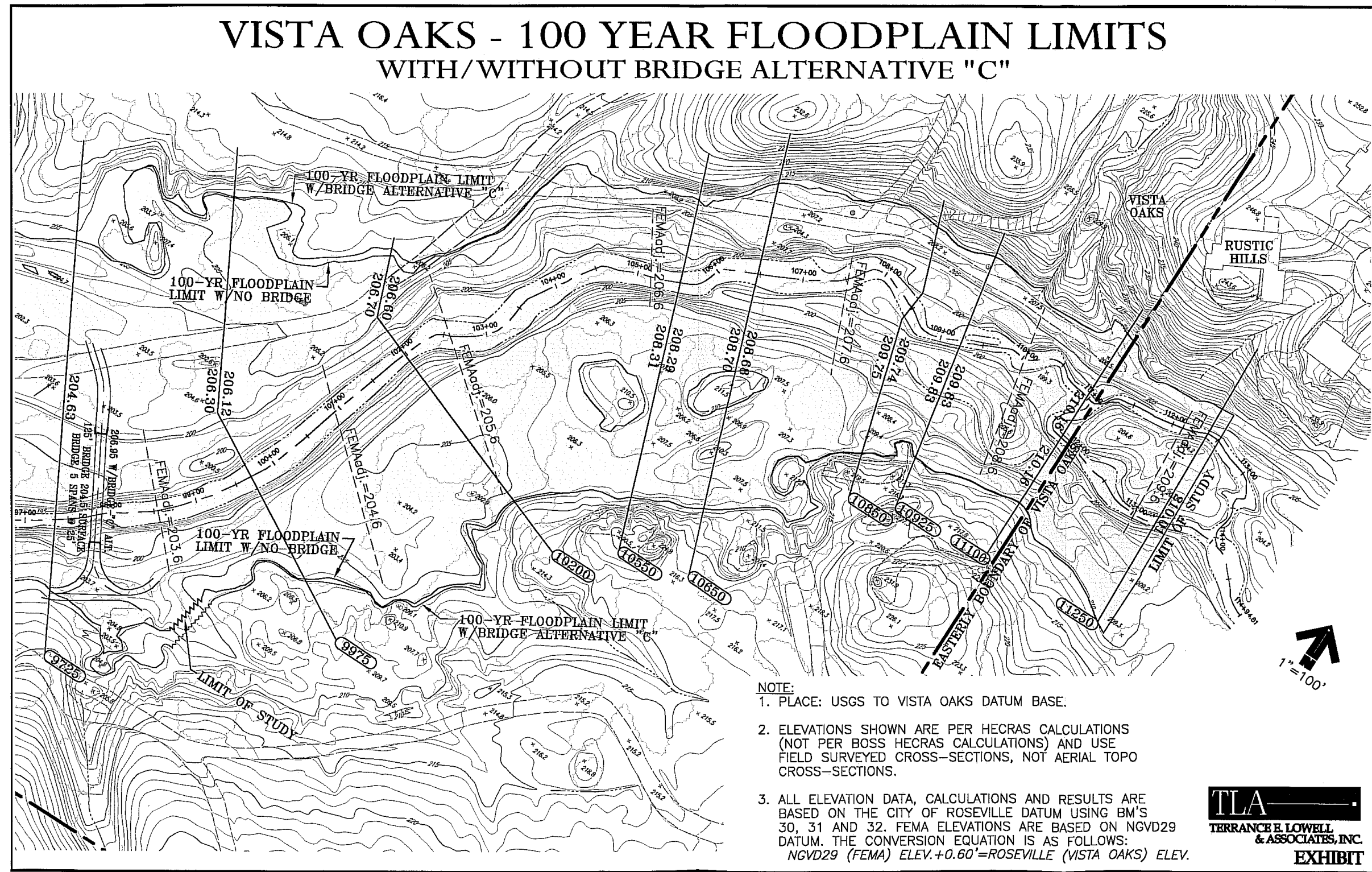
TLA also completed a backwater analysis for the portion of Secret Ravine Creek upstream from the proposed bridge (see page 2 in Appendix F of this Draft EIR) that analyzed potentially increased 100-year flood event impacts that could result from bridge installation.

When discussing the results of hydrological modeling efforts, locations within Secret Ravine Creek are assigned HECRA station ID numbers. These station ID numbers correspond to units of linear feet along the creek as measured from the point of the confluence of Secret Ravine and Miner's Ravine creeks. The ID numbers increase in value as the distance away from the confluence of Secret Ravine and Miner's Ravine creeks increases. By way of reference, the bridge associated with the project is proposed to be located at HECRAS station ID 9770.

The following discussion of water surface elevations at various HECRAS stations in the project vicinity is illustrated in Figure 4.4-6, *Vista Oaks – 100 Year Floodplain Limits With/Without Bridge Alternative “C”*.

With no bridge in place, the water surface elevation at HECRAS station ID 9725 (approximately 45 feet downstream of the proposed bridge location) is estimated to be 204.63 feet. As you proceed upstream, the water surface elevation at HECRAS station ID 9975 (approximately 205 feet upstream of the proposed bridge location) is estimated to be 206.12 feet; the water surface elevation at HECRAS station ID 10200 (approximately 430 feet upstream of the proposed bridge location) is estimated to be 206.60 feet; and at HECRAS station ID 10925 (approximately 1,155 feet upstream of the proposed bridge location) is estimated to be 209.83 feet.

Figure 4.4-6  
Vista Oaks – 100 Year Floodplain Limits With/Without Bridge Alternative “C”



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As noted above, the bridge is proposed to be located at HECRAS station ID 9770. With the bridge in place, the water surface elevation at HECRAS station ID 9725 is estimated to be 204.63 feet (the same water surface elevation as the no bridge condition). As you move upstream away from the bridge, the water surface elevation at HECRAS station ID 9975 is estimated to be 206.30 feet (an increase of 0.18 feet above the water surface elevation with no bridge in place). Continuing upstream to HECRAS station ID 10200, the water surface elevation is estimated to 206.69 feet (an increase of 0.09 feet above the water surface elevation with no bridge in place). Finally, at HECRAS station ID 10925, the water surface elevation is estimated to be 209.83 feet (the same water surface elevation as with no bridge in place), which indicates that the water surface elevation has dissipated to a point where there is no water surface elevation increase as a result of the bridge.

Although the 100-year floodplain changes immediately upstream of the bridge, the 100-year floodplain elevation would stay the same at Vista Oaks's eastern boundary with Rustic Hills. Therefore, no increase in flooding potential to the adjacent upstream property (existing Rustic Hills Subdivision) or decrease in public safety associated with the construction of the proposed bridge would occur. Compared to the no-bridge condition, the backwater effect of each bridge option showed the water surface elevation remains virtually the same (increased or decreased a very small amount immediately upstream of the bridge depending on the storm event) according to the Vista Oaks Rocklin, EIR Bridge Alternative Storm Impact Analysis (Appendix F of this Draft EIR).

The increase in flood stage immediately upstream of the bridge, although minimal, may require a Conditional Letter of Map Revision (CLOMR) to the Federal Emergency Management Agency (FEMA). As stated on the FEMA website, while obtaining a CLOMR may be desired, obtaining conditional approval is not automatically required by the national flood insurance program (NFIP) regulations for all projects in the floodway or one percent annual chance floodplain. A CLOMR is required only for those projects that will result in a one percent annual chance water surface elevation increase of greater than 1.00 foot for streams with base flood elevations (BFEs) specified, but no floodway designated, or any one percent annual chance water surface elevation increase for proposed construction within a regulatory floodway. The increase from the bridge is 2.6 inches, which is less than one foot and is less than one percent of the surface elevation at the 100-year flood stage (0.023 percent); therefore, a CLOMR is not required.

Water surface elevation would increase 0.18 feet on the Vista Oaks site, but would dissipate as you moved upstream from the bridge so that an increase in surface elevation would not occur at the Rustic Hills Subdivision. Because the 0.18-foot surface elevation increase extending 205 feet upstream from the bridge is within the Vista Oaks project boundaries with flood stage not

increasing off-site, the proposed project would not expose people or structures to an increased risk of flooding by placing residential structures within a 100-year floodplain, or expose people or structures to risk of flooding by locating structures where they could impede or redirect flood flows. Therefore, neither people nor existing or proposed structures would be exposed to the risk of damage or destruction from flooding as a result of the projects. For these reasons, implementation of the proposed projects would not result in substantial flood hazards and the impact would be considered *less-than-significant*.

Mitigation Measure(s)

*None required.*

**4.4I-3 Impacts related to construction-phase erosion.**

Vista Oaks and Highlands Parcel A

Construction of the proposed projects would involve incremental grading of the project site, which would substantially increase the amount of soil that could be carried into nearby waterways via surface runoff. Approximately 32 acres would be graded at Vista Oaks and approximately 9 acres at Highlands Parcel A to prepare roadways and future residential foundations (see Figure 4.4-3, Grading and Drainage Plan North, Figure 4.4-4, Grading and Drainage Plan South, and Figure 4.4-5, Grading and Drainage Plan for Parcel A). In addition, construction activities such as excavation and trenching for utilities would result in substantial disturbance of soils, which could increase sedimentation in storm water runoff. Dust from project construction could also be transported to other nearby locations where it could enter surface water runoff and water bodies. In addition, contaminated soil impacted by spills and leaks from heavy equipment and machinery, staging areas, or building sites, can also be a component of runoff that could degrade water quality. Typical pollutants contained in surface runoff include petroleum products and heavy metals (from equipment), and products such as paints, solvents, and cleaning agents that could contain hazardous constituents.

Sediment containing graded or excavated surface materials, or leaks or spills from construction equipment, could also result in water quality degradation if runoff containing the sediment entered receiving waters in sufficient quantities. However, these impacts would be short-term, limited to the duration of construction, and would be heavily regulated by State and local construction regulations.

The erosion and sedimentation impacts due to construction of the major infrastructure and residential units associated with the proposed projects would be considered *potentially significant*.

Mitigation Measure(s)

Implementation of the following mitigation measures would mitigate potential impacts related to construction-phase erosion and sedimentation to a *less-than-significant* level.

The following mitigation measures are identified for the Vista Oaks and Highlands Parcel A projects.

*4.4MM-3a Prior to any grading or construction activities, the applicant shall obtain a General Construction Activity Stormwater Permit as part of the National Pollutant Discharge Elimination System (NPDES) permit process from the Regional Water Quality Control Board. The permit is required to control both construction and operation activities that may adversely affect water quality. The applicant shall also prepare a Stormwater Pollution Prevention Plan (SWPPP) that describes the site, erosion and sediment controls using Best Management Practices (BMPs) and Best Available Technologies, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control. Typical BMPs that could be used during construction of the proposed projects include, but are not limited to the following:*

- Temporary facilities such as straw wattles and sandbags may be used during construction. Temporary facilities will capture a majority of the siltation resulting from construction activities prior to discharging into existing natural channels. In addition, they will trap possible fuel and oil spills from construction equipment to prohibit contamination of surface flows or groundwater. The construction contractor would be required to monitor and maintain all BMPs during construction to ensure they function properly.*

*4.4MM-3b Prior to any grading or construction activities, the applicant shall comply with the provisions of Attachment 4 of the City's Stormwater Permit to the satisfaction of the Public Works Director. These provisions shall also be applicable to the limited graded lots on Phase 1 of the Vista Oaks project site.*

*4.4MM-3c Work shall be scheduled to minimize construction activities in "high-risk" areas and the amount of active disturbed soil areas, during the rainy season (October 15 through May 1). "High-risk areas" include those areas within 50 feet of the USGS water courses, 100-year floodplains, regulated wetlands, and where slopes exceed 16 percent. Unless*

*specifically authorized by the City Engineer or his designees during the rainy season, the developer shall not schedule construction activities in the “high-risk areas” or schedule to have more area of active disturbed soil area than can be managed in conformance with the regulations of the City of Rocklin, the Water Quality Control Board, or any other agency having jurisdiction in this area.*

It should be noted that Mitigation Measure 4.4MM-4a through -4c would also serve to reduce erosion impacts.

#### **4.4I-4      Impacts related to degradation of water quality.**

##### Vista Oaks and Highlands Parcel A

Although the erosion hazard of the undisturbed soils on the project sites are low (see Chapter 4.5, Geology), existing runoff from the sites could contain sediment that includes small amounts of nutrients, naturally occurring metals and minerals, pesticides, and organic matter. Urban runoff studies throughout the U.S. have shown that the concentration of suspended soils (sediment) usually decreases as exposed soils are covered by impervious surfaces, although some sediment may still be present due to entrained dust on roadways and parking lots and from any remaining open areas. Activities that could increase the types or quantities of non-naturally occurring pollutants in runoff due to development include motor vehicle operations, residential maintenance, littering, careless material storage and handling, domestic animal and wildlife wastes, and pavement wear. Pollutants typically associated with urban uses, such as those that would be developed as a result of the proposed projects, include oil and grease, coliform bacteria, petroleum hydrocarbons (gas and diesel fuels), nitrogen, phosphorus, heavy metals such as lead, copper, and zinc, and suspended soils. Pesticides, herbicides, and other landscape maintenance products typically used in residential developments could also be present in urban runoff.

Urbanization of natural lands through development introduces contaminants, as described above, and potentially other organic substances discharged by individual homeowners. Although these sources are not expected to significantly degrade surface waters, they would contribute to possibly significant cumulative levels of organic constituents in the regional urban runoff. Therefore, the impact of the anticipated development and the proposed projects would be considered *potentially significant*.

##### Mitigation Measure(s)

Implementation of the following mitigation measures would mitigate potential impacts related to indirect effects to a *less-than-significant* level.

The following mitigation measures are identified for the Vista Oaks and Highlands Parcel A projects.

*4.4MM-4a     Appropriate Best Management Practices (BMPs) and Best Available Technologies (BATs) shall be incorporated into project design to reduce urban pollutants in runoff, consistent with goals and standards established under federal and State non-point source discharge regulations (NPDES permit) and Basin Plan water quality objectives. Storm water runoff BMPs selected from the Storm Water Quality Task Force, the Bay Area Storm Water Management Agencies Association Start at the Source – Design Guide Manual, or equally effective measures shall be identified prior to final design approval.*

*To maximize effectiveness, the selected BMPs shall be based on finalized site-specific hydrologic conditions, with consideration for the types and locations of development. Mechanisms to maintain the BMPs shall be identified in the conditions of approval and on improvement plans. Typical BMPs and BATs that could be used at the proposed projects include, but are not limited to, the following:*

- Application of appropriate signage to all storm drain inlets indicating that they outlet to the natural drainageways;*
- Installation of Educational Tributary Signs that identify waterways at street and trail locations that are visible to pedestrians. Signs should contain information such as water body name, elevation, latitude and longitude, salmon spawning habitat, and distance to Pacific Ocean in miles.*
- Application of a street sweeping program to remove potential contaminants from street and roadway surfaces before they reach drainages;*
- Minimize sources of concentrated flow by maximizing use of natural drainages to decelerate flows, collect pollutants and suspended sediment;*
- Placement of velocity dissipaters, rip-rap, and/or other appropriate measures to slow runoff, promote deposition of waterborne particles, and reduce the erosive potential of storm flows;*
- Prompt application of soil protection and slope stabilization practices to all disturbed areas;*
- Creation of storage basins consisting of depressed areas, usually lined, that are sized to hold storm runoff*

*and settle out material (the facility usually has a type of outlet device that is above the bottom of the basin or a small rip-rapped berm over which the treated water can flow);*

- *Creation of a below-ground storage basin consisting of vertical or horizontal corrugated metal or HDPE pipes sized to allow the volume of water required to be treated to percolate into the ground;*
- *Use of fossil filters consisting of small filters that are placed like troughs around the inside top drain inlets or at ditch outlets; and*
- *Use of rock-lined ditches, which are surface ditches that are lined with rock, with or without filter material, with the rock lining material designed to allow water to filter into the ground.*

*Selected BMPs shall be noted on the Improvement Plans submitted by the applicant for the proposed projects.*

*4.4MM-4b Project construction shall be restricted within 100 feet of Secret Ravine Creek or the Aguilar Road tributary to the dry months of the year (i.e., May through October).*

*4.4MM-4c Provisions for the maintenance and periodic inspection of permanent facilities outside of the public right-of-way (e.g. sand/oil separators, filters, and other BMPs/BATs) shall be provided for in the Covenants Conditions and Restrictions (CC&Rs) of the Homeowners' Association (HOA). These provisions would include periodic inspection, cleaning, and the replacement of filter materials by the HOA, as necessary to retain the integrity of the BMPs.*

## **Cumulative Impacts and Mitigation Measures**

The cumulative context for the Hydrology and Water Quality chapter compares existing and future drainage patterns for Secret Ravine Creek, including potential impacts of the proposed projects and Rocklin *General Plan* buildout.

### **4.4I-5 Cumulative hydrological impacts related to the potential for localized flooding.**

#### Vista Oaks and Highlands Parcel A

The proposed projects and buildout of the *General Plan* would increase the amount of impervious surfaces to the drainage area, which includes the project sites. The projects' storm water management system would include overland

release channels to manage the 100-year storm. In addition, the area of the 100-year floodplain, as determined by FEMA, is limited to the areas adjacent to Secret Ravine Creek, and the extent of the floodplain is generally within a plus 10-foot elevation gain from the bed of Secret Ravine Creek and extends less than 50 feet from the centerline of the creek. According to the tentative map for the project, none of the proposed residential parcels are located within the existing 100-year floodplain, and the 100-year floodplain would be preserved within the permanent open space parcels. Although the proposed bridge would create an increase in water surface elevation (0.18 feet at its highest point) for the portion of the creek between 205 feet and 1,330 feet upstream of the bridge, this increase would occur within the boundaries of the Vista Oaks project site. Water surface elevations would return to the existing level 175 feet west of Vista Oak's eastern boundary. Downstream of the bridge, water surface elevations would not be increased. The 100-year floodplain would not change except for locations adjacent to the bridge within the Vista Oaks project site. The flood plain boundary adjacent and upstream of the existing Rustic Hills would not be affected. Therefore, no increase in flooding potential to the adjacent upstream property (existing Rustic Hills Subdivision) or decrease in public safety associated with the construction of the proposed bridge would occur. TLA prepared a *Preliminary Drainage Report* for the Highlands Parcel A project in September 2002. The report states that the Stormwater Management Manual (SWM) requires post-project objective flows for 2-year, 10-year, and 100-year storm events to be less than pre-project flow conditions unless master drainage plans indicate otherwise.

Because the proposed projects would not result in any flooding impacts, the projects would not contribute to cumulative flooding in the project area or region resulting in a *less-than-significant* cumulative impact.

Mitigation Measure(s)

*None required.*

**4.4I-6 Cumulative impacts related to degradation of water quality.**

Vista Oaks and Highlands Parcel A

Development in the Dry Creek watershed could cumulatively increase urban contaminant loading, which could adversely affect water quality. Cumulative development along Secret Ravine Creek and within the Dry Creek watershed (which includes development in Western Placer County, Loomis, and the Cities of Rocklin and Roseville), including the proposed projects, would result in increased impervious surfaces that could increase the rate and amount of runoff, thereby potentially adversely affecting existing surface water quality through increased sedimentation and mobilization of urban pollutants. The primary sources of water pollution include runoff from roadways and parking lots; runoff from landscaping areas; commercial and industrial activities; non-

storm water connections to the drainage system; accidental spills; and illegal dumping. Runoff from roadway and parking lots could contain levels of oil, grease, and heavy metals; additionally, runoff from landscaped areas could contain elevated concentrations of nutrients, fertilizers, and pesticides.

The 1990 *City of Rocklin General Plan Update EIR* states that buildout of the *General Plan* would result in an increase in storm water runoff due to the additional impervious surfaces created. The *General Plan Update EIR* found that the effect of new development based upon buildout of the *General Plan* would result in a significant impact to water quality.

In addition, the *Preliminary Drainage Report* for the Highlands Parcel A site found that although the proposed project drainage facilities would consist of drainage inlets, pipes and a culvert, the post-development drainage on the project site would not be less than the pre-project conditions. Therefore, development of the proposed project could result in potentially significant impacts regarding stormwater runoff. However, the project drainage design would be built in compliance with the PCFCWCD's *Storm Water Management Plan*, California Storm Water BMPs, the City of Rocklin's requirements, FEMA, and the PCFCWCD *Dry Creek Watershed Flood Control Plan* containing the 100-year flood event.

The EIR for the *Rocklin General Plan* addressed degradation of water quality by sedimentation and urban contaminant loading as a potentially significant impact from development under the *General Plan*. Similarly, the addition of the Vista Oaks and Highlands Parcel A subdivisions would result in a ***potentially significant*** impact.

#### Mitigation Measure(s)

Implementation of Mitigation Measures 4.4MM-3a and -3b and 4.4MM-4a through -4c for the Vista Oaks and Highlands Parcel A projects would mitigate potential cumulative impacts related to regarding degradation of water quality to a *less-than-significant* level.

#### **Endnotes**

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<sup>1</sup> *Vista Oaks Preliminary Drainage Report*, Terrance E. Lowell & Associates, August 3, 2001.

<sup>2</sup> *Highland Crown Preliminary Drainage Report*, Terrance E. Lowell & Associates, September 9, 2001.

<sup>3</sup> *Vista Oaks Rocklin EIR Bridge Alternative Storm Impact Analysis*, Terrance E. Lowell & Associates, April 2004.

<sup>4</sup> *Supplement #1 to Vista Oaks Rocklin EIR Bridge Alternative Storm Impact Analysis*, Terrance E. Lowell & Associates, July 29, 2004.

<sup>5</sup> Martin, Bob. Phone conversation with Jessica Hankins. September 21, 2005.

<sup>6</sup> City of Rocklin General Plan, 1991 (p. 61).

<sup>7</sup> City of Rocklin General Plan, 1991 (p. 88).